

RAF MILDENHALL

2010 WATER QUALITY

REPORT

Introduction

Air Force Instruction 48-144, *Safe Drinking Water Surveillance Program*, and the United States Environmental Protection Agency (US EPA) require that all community water systems provide to consumers an annual water quality report. This report will help you understand where your drinking water comes from and what is in it. It will help you to make informed choices that affect your families' health and help you understand the importance of protecting our drinking water sources.

Source Water

The 100th Civil Engineering Squadron (CES) operates RAF Mildenhall's potable water distribution system. Water comes from a borehole (well) that is recharged from groundwater obtained from a limestone (chalk) aquifer situated directly under the base.

Treatment Process

RAF Mildenhall's water supply is treated to remove volatile organic compounds and pesticides using aeration and granular activated charcoal before being chlorinated using a sodium hypochlorite solution. Chlorine is added to the water supply for disinfection purposes and prevents bacteriological growth in the distribution system.

Testing

Bioenvironmental Engineering (BE) collect bacteriological samples from various locations in the water distribution system. These samples are analyzed in the BE water lab to ensure no bacteriological growth is present in the distribution system. Also, BE collect water samples for chemical and radiological analysis from representative locations in the water system and send them to Northumbrian Water Laboratory (NWL) for analysis. NWL is headquartered in Newcastle upon Tyne, England. They have laboratories throughout England, but primarily analyzing drinking water at their Horsley

laboratory in Newcastle. Several water samples are sent to the US Army Public Health Command Laboratory (PHCR-Europe). All lab results are reviewed and maintained by the BE Flight at RAF Lakenheath to ensure compliance with both U.K. Drinking Water Inspectorate (DWI) and U.S. safe drinking water standards.

Water Analysis Results

RAF Mildenhall's water supply is tested for 127 substances. The table below lists the contaminants detected that require reporting by the US EPA and the January 2005 US Department of Defense Environmental Final Governing Standards - United Kingdom (FGS-UK).

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. **The presence of contaminants does not necessarily indicate that water poses a health risk.** More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at (202) 564-3750 or by going to their ground and drinking water website at <http://www.epa.gov/safewater>.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or from human activity. The table of analysis results below lists possible, sources for detected contaminants; an identification of a possible source is not specific to RAF Mildenhall, but applies to all water in general.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems and wildlife
- Inorganic contaminants, such as salts and metals, which can be naturally occurring or

result from urban storm runoff and industrial or domestic wastewater discharges

- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential use
- Organic chemical contaminants, including synthetic or volatile organic chemicals, which are by-products of industrial processes and can come from gas stations, urban storm water runoff and septic systems
- Radioactive contaminants, which can be naturally occurring or be the result of industrial activities

In order to ensure that tap water is safe to drink, limits are established on the amount of certain contaminants in water provided by public water systems. The limits below are from the FGS-UK. This document integrates US and UK requirements by implementing the more stringent limit of any chemical regulated by either country.

Results Discussion

The results in the table below include all chemicals covered by both U.K. DWI and U.S. safe drinking water standards for which analysis was performed and concentrations of the chemicals that were detected from 1 January 2010 to 31 December 2010.

During CY2010 sampling time frame, RAF Mildenhall did not receive any exceedances over the Maximum Contaminant Limit (MCL).

Additional Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, and some elderly and infants can be particularly at risk from infections.

These people should seek advice about drinking water from their health care providers. The US EPA and US Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (202) 564-3750 or on the US EPA's website, <http://www.epa.gov>.

Input and Information

This report is available on RAF Mildenhall's website: <http://www.mildenhall.af.mil/>. Hard copies of this report are available at the Public Affairs Office, Bldg 239, Room 134. If you have questions, please contact Capt Tho Tran or SSgt Sarah Schultz in Bioenvironmental Engineering at 01638 528047 or DSN 226-8047.

TEST RESULTS

SUBSTANCE (* See note 1)	RANGE ND = None detected (See Note 2)	MAXIMUM CONTAMINATE LIMIT	POSSIBLE SOURCE (Applies to all water in general) & COMMENTS
Alkalinity*	220-230 mg/L	30 mg/L HCO ₃	
Aluminium*	ND - 0.035 mg/L	0.2 mg/L	Widely present in the soil
Arsenic	0.00039 mg/L	0.05 mg/L	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes
Barium	0.015 mg/L	1 mg/L	Present as a trace element in both igneous and sedimentary rocks.
Boron	0.03 - 0.064 mg/L	2 mg/L	Used in glass manufacture (fibreglass, borosilicate glass, enamel, frit and glaze), soaps and detergents
Calcium*	97 - 100 mg/L	250 mg/L	Erosion of natural deposits, dissolved from rocks such as limestone, marble, calcite, dolomite, and gypsum.
Chloride*	51 - 52 mg/L	400 mg/L	
Conductivity	470 - 590 µS/cm @ 20°C	1500 µS/cm @ 20°C	Some conductivity is expected in drinking water
Copper*	0.33 mg/L	3 mg/L	Corrosion of household plumbing system
Dry Residues At 180°C*	420 - 430 mg/L (after drying at 180°C)	1500 mg/L (after drying at 180°C)	
Fluoride	0.13 - 0.15 mg/L	1.5 mg/L	Erosion of natural deposits; discharge from fertilizer and aluminum factories
Gross Alpha	ND - 0.51 pCi/L	15 pCi/L	A natural element of the Earth's crust
Gross Beta	1.1 - 1.3 pCi/L	50 pCi/L	A natural element of the Earth's crust
Lead	0.00056 mg/L	0.05 mg/L	Corrosion of household plumbing systems; Erosion of natural deposits
Magnesium	3 - 3.4 mg/L	50 mg/L	
Manganese*	0.00047 - 0.0029 mg/L	0.05 mg/L	
Nickel	0.0011 mg/L	0.05 mg/L	Corrosion of plumbing system
Nitrate	24 - 28 mg/L (as NO ₃)	44.3 mg/L (as NO ₃)	Runoff from fertilizer use
Oxidizability	0.4 - 0.47 mg/L	5 mg/L	None
pH	7.7 - 8.2	5.9 - 9.5	Drinking water is expected to have a fairly neutral pH amount (5.5-9.5)
Potassium*	1.2 mg/L	12 mg/L	Released naturally from clay materials and minerals in the Earth's surface
Qualitative Odor*	0 - 3.2 DN	3 DN at 25°C	
Qualitative Taste*	0 - 3.8 DN	3 DN at 25°C	
Sodium	22 mg/L	150 mg/L	Stems from rocks and soils and naturally ends up in water systems
Sulphate*	43 - 44 mg/L	250 mg/L	

SUBSTANCE (* See note 1)	RANGE ND = None detected (See Note 2)	MAXIMUM CONTAMINATE LIMIT	POSSIBLE SOURCE (Applies to all water in general) & COMMENTS
Total Hardness*	110 - 120 mg/L Ca	60 mg/L Ca (Minimum)	
Total Organic Carbon	1.6 - 1.7 mg/L	No significant increase over that normally observed	Previous data shows no abnormal trend
TTHMs	0.009 - 0.0184 mg/L	0.1 mg/L	By-product of drinking water chlorination
Turbidity*	0.1 - 0.14 FTU	4 FTU	Measure of water clarity, not health related
Zinc*	0.0053 mg/L	5 mg/L	

Definitions:

Ca – chemical symbol for calcium. Minerals found in hard water cause by limestone, chalk and in other mineral deposits.

DN - Dilution Number. The dilution number is related to the number of times a laboratory dilutes a sample to be tasteless or odor-free. A dilution number of zero equates to a zero taste or an odor-free sample.

FGS-UK - Final Governing Standards for the United Kingdom - The governing environmental regulation for US military bases in the UK.

FTU - Formazin Turbidity Unit. Unit of measure used in turbidity measurement based on a chemical reaction that produces insoluble particulates of uniform size.

mg/L - milligrams per Liters - A unit of measure used to describe the levels of detected contaminants. 1 milligram per liter is equivalent to 1 part per million.

ND - Not Detected - No chemical detected, however laboratory can only detect a specified quantity or concentration of the chemical in drinking water. This is known as the Limit of Detection.

NO₃ - inorganic or organic ester or salt of nitric acid, containing the (NO₃) ion. Nitrates are the most water soluble of all salts, and play a major part in nitrogen cycle and nitrate pollution.

PCV - Prescribed Concentration or Value - The maximum concentration of a contaminant or the maximum value of any parameter, which might affect the wholesomeness, or aesthetics of a water supply.

pCi/L - picocuries per liter - Unit of measure used to express the results of radioactivity tests in water.

TTHM - Total Trihalomethanes. The sum of the detected concentrations of chloroform, bromoform, dibromochloromethane, and bromodichloromethane in mg/L.

µS/cm - microsiemens per centimeter. Is a unit expressing the amount of electrical conductivity of a solution.

NOTES:

(1) Items marked with an asterisk (*) are ‘secondary standards’ with a PCV rather than an MCL. See PCV and MCL definitions above. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water.

(2) Limitations in laboratory performance results in analysis for some contaminants being reported as “not detected (ND).” The lowest level of contaminant that the laboratory can detect is called the Limit of Detection (LOD). In 2010, levels of contaminants were verified to be below the FGS-UK MCL; therefore, compliance was met.